

BIOSPHERE *Checklist*

Control and Management (*Credit level)

1. **Pollution** is caused by a substance present in the environment which **causes harm** to organisms. **Air, fresh water, sea and land** are all affected.
2. There are 3 main sources of pollution - **industry, agriculture** (farming) and **domestic** (the home).
3. Examples of pollution from each source include:-
Industry - **sulphur dioxide gas** which causes acid rain
Agriculture - **pesticides, herbicides, fertilisers** can all be washed into rivers causing damage or end up in or on our food.
Domestic - **untreated sewage** can cause oxygen depletion in rivers as bacteria break it down.
- 4* Burning **fossil fuels** (coal, oil, natural gas) adds smoke to the atmosphere and increases the level of carbon dioxide which adds to the **greenhouse effect**.
- 5* **Nuclear power** stations produce **radioactive waste** that takes thousands of years to become safe. Meanwhile, it has to be stored in glass or buried deep in underground caverns.
6. **Control measures** can be used to limit the damage caused through pollution.

clean air acts prohibit black smoke from factories;
scrubbers in the chimneys of power stations stop sulphur dioxide emissions;
catalytic converters and lead free petrol in cars reduce poisonous wastes from motor cars;
sewage treatment works treat sewage before it is released into rivers.
- 7* Sewage contains **organic waste** which is broken down by **bacteria**. The waste is a **food source** for the bacteria. The bacteria increase greatly in number and **use up the oxygen** in the water. Other water living animals (such as insects and fish) cannot live in such oxygen depleted water.
8. Downstream from the sewage outflow the numbers and types of organism changes. In unpolluted water we can find **stonefly and mayfly nymphs**. As pollution increases they are replaced by other species until very polluted water contains rat tailed maggots and sludge worms.
- 9* Stonefly nymphs and mayfly nymphs are called **indicator species** since their presence or absence shows the level of pollution in the environment. Other pollution indicator organisms are **lichens** and ladybirds.

10. **Conservation** involves the proper management and use of the planet's resources.
11. Fish stocks are limited and **overfishing** is controlled by **fishing quotas** and coastal fishing limits.
- 12* **Rain forests** can be **managed** to protect them from destruction by improving the growth of food and stopping the 'slash and burn' habits of native farmers.
- 13* **Desertification** occurs due to overuse of land for growing crops. This can be prevented by using **crop rotation and natural fertilisers**.
14. Conservation also involves **zoos** in **breeding programmes** to increase the numbers of endangered animals and some success has been recorded in returning animals to the wild.